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indicated service; generates service data unit SDU-4; and outputs SDU-4 to logical link control 610.

It is to be understood that the above-described embodiments are merely illustrative of the present invention and that many variations of the above-described embodiments can be devised by those skilled in the art without departing from the scope of the invention. It is therefore intended that such variations be included within the scope of the following claims and their equivalents.

The invention claimed is:

**1.** An apparatus comprising:

- (a) a processor for generating an outgoing message to be transmitted to a remote terminal via a first service data unit;
- (b) a first circuit for:
  - (i) providing a first medium-access-control service, and
  - (ii) generating a first protocol data unit based on said first service data unit;
- (c) a second circuit for:
  - (i) providing a second medium-access-control service, and
  - (ii) generating a second protocol data unit based on said first protocol data unit;
- (d) a physical control for:
  - (i) generating a third protocol data unit based on said second protocol data unit, and
  - (ii) transmitting a first signal based on said third protocol data unit to said remote terminal;
- (e) a bus for:
  - (i) transferring signals between said processor and a peripheral, and
  - (ii) transferring said first protocol data unit from said first circuit to said second circuit; and
- (f) wherein said first, second, and third protocol data units are different.

**2.** The apparatus of claim 1 wherein said bus transfers signals between said processor and said peripheral via an input/output controller.

**3.** The apparatus of claim 1 wherein said first medium-access-control service is independent of the state of said physical control;

and wherein said second medium-access-control service is dependent on the state of said physical control.

**4.** The apparatus of claim 3 wherein said first medium-access-control service is transmit queuing.

**5.** The apparatus of claim 3 wherein said second medium-access-control service is channel access.

**6.** The apparatus of claim 1 wherein said physical control is also for:

- (iii) receiving a second signal from said remote terminal, and
  - (iv) generating a second service data unit based on said second signal;
- wherein said second circuit is also for (iii) generating a third service data unit based on said second service data unit; and
- wherein said bus is also for (iii) transferring said third service data unit from said second circuit to said first circuit.

**7.** The apparatus of claim 6 wherein said first circuit is also for (iii) generating a fourth service data unit based on said third service data unit;

and wherein said processor is also for (iii) receiving an incoming message from said remote terminal via said fourth service data unit.

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**8.** The apparatus of claim 1 wherein said peripheral is a memory, and wherein said transferring said first protocol data unit from said first circuit to said second circuit comprises:

- (1) transferring said first protocol data unit from said first circuit to said memory,
- (2) transferring an address of said first protocol data unit in said memory to said second circuit, and
- (3) transferring said first protocol data unit from said memory to said second circuit.

**9.** The apparatus of claim 8 wherein said transferring of (1), (2), and (3) are via an input/output controller.

**10.** An apparatus comprising:

- (a) a first integrated circuit comprising:
  - (i) a processor for generating an outgoing message to be transmitted to a remote terminal via a first service data unit, and
  - (ii) a first circuit for providing a first medium-access-control service and generating a first protocol data unit based on said first service data unit;
- (b) a second integrated circuit comprising:
  - (i) a second circuit for providing a second medium-access-control service and generating a second protocol data unit based on said first protocol data unit, and
  - (ii) a physical control for generating a third protocol data unit based on said second protocol data unit and transmitting a first signal based on said third protocol data unit to said remote terminal;
- (c) a bus for transferring signals between said first integrated circuit and a peripheral and for transferring said first protocol data unit from said first integrated circuit to said second integrated circuit; and
- (d) wherein said first, second, and third protocol data units are different.

**11.** The apparatus of claim 10 wherein said bus transfers signals between said first integrated circuit and said peripheral via an input/output controller.

**12.** The apparatus of claim 10 wherein said first medium-access-control service is independent of the state of said physical control;

and wherein said second medium-access-control service is dependent on the state of said physical control.

**13.** The apparatus of claim 12 wherein said first medium-access-control service is transmit queuing.

**14.** The apparatus of claim 12 wherein said second medium-access-control service is channel access.

**15.** The apparatus of claim 10 wherein said physical control is also for receiving a second signal from said remote terminal and for generating a second service data unit based on said second signal;

wherein said second circuit is also for generating a third service data unit based on said second service data unit; and wherein said bus is also for transferring said third service data unit from said second integrated circuit to said first integrated circuit.

**16.** The apparatus of claim 15 wherein said first circuit is also for generating a fourth service data unit based on said third service data unit; and wherein said processor is also for receiving an incoming message from said remote terminal via said fourth service data unit.

**17.** The apparatus of claim 10 wherein said peripheral is a memory, and wherein said transferring said first protocol data unit from said first integrated circuit to said second integrated circuit comprises:

- (1) transferring said first protocol data unit from said first integrated circuit to said memory,